

Mathemagic!

Volume 4

Beaconsfield Upper Primary School

Limit 2

This is a very simple game for two people to play. You need 15 counters of any sort. Take turns to remove 1 or 2 counters from the pile of 15 counters. (No more, the limit is 2).

Eventually one person will win by removing the remaining counter(s).

1 Play the game with another person.

2 Play enough games for you to work out how to win if you are the first player.

Discuss this with your opponent. Write the method for the first person to win.

This is called a winning strategy.

3 In this game suppose both players know the winning strategy. What is the chance that the first player will win? Explain how you worked this out.

4 Play the game again but start with a random number of counters in the pile.

How does this change the probability of the first player winning?

Limit 4

Take turns to move 1, 2, 3 or 4 counters from the pile of 15. (No more, the limit is 4.)

Eventually one person will win by removing the last counter(s) from the pile.

5 Play the game with another person.

6 Play enough games for you to work out how to win if you are the first player.

Discuss this with your opponent.

7 In this game suppose both players know the winning strategy. What is the chance that the first player will win?

8 If the initial number of counters is a random number between 1 and 15, how does this change the probability of the first player winning?

Website: www.superkids.com/aweb/tools/logic/

Catch 7

The first player puts a counter on top of a number and says the total. On your turn, move the counter to another number and say the total.

The winner makes the game number (7) or forces their opponent to go over 7.

1

2

3

Play Money

If each letter of the alphabet is given a monetary value:

AEIOU = \$5.00

BCDFGHRST = \$10.00

QWXZ = \$20.00

How much is your name worth?

What is the most expensive 5 letter word you know?

Can you find a word worth exactly \$50.00?

Calculator Trick

This calculation gives the answer 13 whatever number you start with.

Eg: Think of a three digit number for example 853.

Enter it again.

Divide by 7

Divide by the original number (853).

Divide by 11 and then press =

Try this with other three digit numbers.



"Algebra class will be important to you later in life because there's going to be a test six weeks from now."



Game of 22

This is a two-person game in which you use the numbers 1, 2, 3, and 4 as shown in the following diagram. Take turns to cross out one of the numbers and try to either make a total of 22 or force your opponent to go over 22. Four games are drawn up ready to play.

1 2 3 4 1 2 3 4

1 2 3 4 1 2 3 4

1 2 3 4 1 2 3 4

1 2 3 4 1 2 3 4

1 2 3 4 1 2 3 4

1 2 3 4 1 2 3 4

1 2 3 4 1 2 3 4

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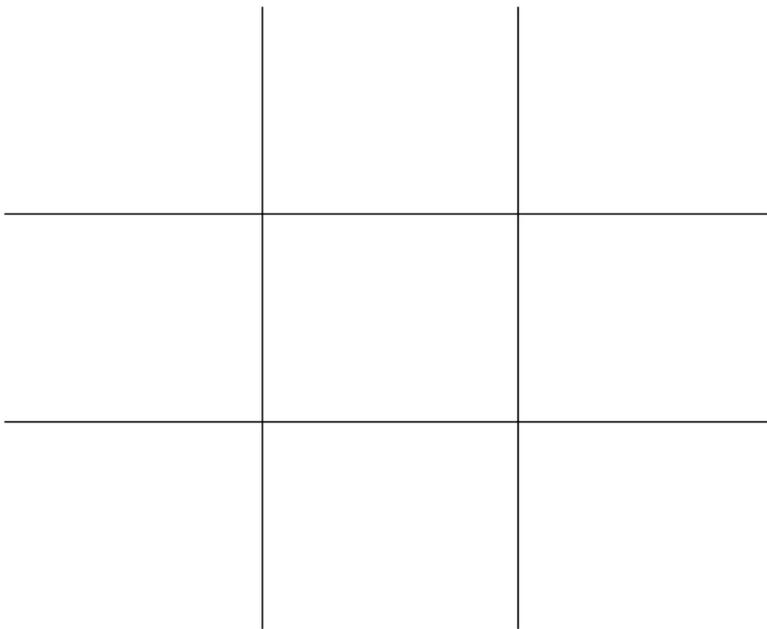
1 2 3 4 1 2 3 4

Board games

Noughts and crosses (Os and Xs)

This is the most popular board game of all time. You know the rules. To save paper play with five counters in your own colour.

Is it possible for the first player to force a win? If so, how is it done?



Moveable noughts and crosses (or Os and Xs)

Each player gets only three counters in their colour.

Take turns to place them on the board.

Then take turns to move them to a neighbouring empty space in the same row or column. The aim is to get three in a line, horizontally, vertically or diagonally.

Is it possible for the first player to force a win? If so, how is it done?